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ABSTRACT

This remedial mathematics curriculum for deaf community college students is organized into 22 lessons grouped into three levels: whole numbers, fractions, and decimals. Preliminary versions of the curriculum have been used in Deaf Prep classrooms and taken through a development and revision process. Each lesson follows the same pattern: topic introduction, review of relevant previous topics, discussion of topic-specific vocabulary, in-depth instruction of the topic with demonstration of procedures used, discussion, and practice. A pre/post test is also provided. (DB)

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ED 444 300

Pikes Peak Community College

# Deaf Prep

PROGRAM

# Mathematics Curriculum

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EC 307990

# Pikes Peak Community College

## Deaf Prep Program

# Mathematics Curriculum

Developed by Paula George
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# NOTES TO INSTRUCTORS

Preliminary versions of this curriculum were used in Deaf Prep classrooms and taken through a development and revision process. During this process, we found that consistency and predictability are necessary to help deaf students lessen confusion about the presented materials; therefore, all lessons in this curriculum follow the same pattern. First, the topic is introduced with a brief explanation, a review of previous topics that will again be used, and a discussion of any topic-specific vocabulary. Then the lesson proceeds into instruction involving a more in-depth explanation of the topic along with a demonstration of the procedures being explained. If methods for estimating answers are appropriate and helpful, they are also presented at this time (We have found that a separate lesson on estimating and rounding may be necessary for some students.). After instruction comes discussion, during which students have an opportunity to offer their observations about the topic, ask questions, practice examples, and devise ways to estimate answers. Discussion is followed by execution/manipulation, involving instructor-provided materials--work sheets, objects to manipulate, flash cards, etc.--that emphasize target skills. Work should occur initially during class time so that the instructor can monitor progress and immediately address mistakes, incorrect or creative procedures, etc. Many of our students work more accurately on the chalk/white board, an individual wipe-off board, or graph paper than on conventional lined paper, so the instructor should try to provide several options. If the instructor feels that more practice is needed, homework may also be assigned, but only after it is ascertained that students have a grasp of the concepts underlying the topic. Next comes mastery--the evaluation of students' understanding of the topic. This can take many forms: math "bees," games such as Bingo, timed or untimed paper-and-pencil quizzes, etc. We require 90% accuracy on any given topic before students can progress to the next topic. If such mastery is not attained, the instructor may choose to provide students with more instruction, discussion, manipulation, or practice problems, time for individual tutoring work, or pairing with students who have achieved mastery of the topic (good practice for both!). Students must understand that anything less than 90% mastery will not allow them to move on, thereby objectifying their progress and giving them the responsibility for the speed of their progress. The final step in each lesson is bridging the information from math class to other classes and/or to students' lives outside of classes. This step answers the oft-asked question, "Why do I need to know this?" Because of the emphasis we place on this step, we have had many students report having used skills elsewhere that they remembered learning in math class.

Lessons in this curriculum include some suggestions for various steps; however, they are not meant to limit or define precisely what is taught, so instructors are encouraged to make notes of their own methods and ideas. The first two lessons include example demonstration and execution problems, and instructors are free to create their own problems that suit their situation. Lessons should proceed in the given order, but there is no set time frame for these lessons--we have experienced some lessons requiring two days and others three weeks, depending upon students' skills and backgrounds. Flexibility and creativity are instructors' most valuable tools!

# Resources

The following are materials that we have found useful. In addition to these specific resources, instructors may also want to look for others that would suit their students and situations. Teachers' supply stores and new and used bookstores have many possibilities from which to choose.

*Building Basic Skills in Mathematics* by Jerry Howett
Contemporary Books, Inc., Chicago, IL

*Everyday General Mathematics* by Henry Cieslinski
Hayes School Publishing Co., Inc.

*Mathemagic* by Don Fraser
Dale Seymour Publications, Palo Alto, CA

*Math Story Problems* by Marcia Shank
Educational Insights

*Scribble Scrabble* by Sharp, Sharp, and Metzner
TAB Books

*Understanding Math Story Problems,* Books 1, 2, 3 by Martha McGlothlin
Pro-Ed, Austin, TX

# Pre/post Test

This test is to be used both as a diagnostic tool to determine where weaknesses exist at the beginning of the class and as a comparison tool to show progress during the class. Special attention should be paid to any patterns of strengths or weaknesses by individual students or by groups of students so that plans for class procedures can be made (individual tutorials, small group work, large group work, etc.). If a student achieves 90% or better accuracy on this test, the pretest in *Building Basic Skills in Mathematics* may be used to determine level.

# MATH

**Fill in the missing numbers.**

__ 4 __ __ __ 12 14 __ __ 20

__ 7 __ __ __ 11 __ 13 14 __ __

50 __ __ 35 __ __ __ 15 10 __

30 __ __ 21 18 __ __ __ 6 __ __

4 __ __ __ 16 __ __ 25 __ __ 34

**86,520,473**

Which number is in the ten thousands place? ____

Which number is in the hundreds place? ____

5 is in the _____ place.

7 is in the _____ place.

8 is in the _____ place.

**Words and Numbers**

632 in words is _____ .

3,486 in words is _____

_____ .

Four hundred thirty-seven in numbers is _____ .

Seven thousand three in numbers is _____ .

11 thousands, 4 hundreds, 6 tens, 0 ones = _____ .

3 tens, 5 thousands, 0 hundreds, 7 ones = _____ .

**Greater than/Less than**

| | | |
|---|---|---|
| 5 ___ 7 | 36 ___ 15 | 1005 ___ 998 |
| 0 ___ 2 | 42 ___ 56 | 492 ___ 429 |
| 6 ___ 1 | 70 ___ 68 | 631 ___ 631 |

**Write in order least to greatest.**

| | | |
|---|---|---|
| 3, 7, 5, 0, 11, 6, 9 | 4, 2, 7, 3, 9, 12, 1 | 10, 3, 0, 7, 12, 19, 28 |
| _ _ _ _ _ _ _ | _ _ _ _ _ _ _ | _ _ _ _ _ _ _ |

**Write in order greatest to least.**

| | | |
|---|---|---|
| 6, 3, 8, 7, 5, 0, 4 | 9, 11, 8, 3, 2, 5, 1 | 18, 4, 8, 16, 9, 3, 11 |
| _ _ _ _ _ _ _ | _ _ _ _ _ _ _ | _ _ _ _ _ _ _ |

**Number Line**

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

|___|___|___|___|___|___|___|___|___|___|___|___|___|___|___|___|___|

Start at 6. Move +4. Where are you? ____

Start at 3. Move +7. Where are you? ____

Start at 11. Move -6. Where are you? ____

Start at 4. Move +12. Move -6. Move -2. Where are you? ____

Start at 12. Move +3. Move -8. Move -6. Move +1. Where are you? ____

Calculations

| | | | | |
|---|---|---|---|---|
| 5 | 3 | 8 | 11 | 13 |
| +4 | +2 | +4 | +6 | +0 |
| 12 | 18 | 21 | 32 | 45 |
| + 9 | + 5 | + 12 | +26 | +35 |
| 63 | 47 | 76 | 128 | 383 |
| +29 | +54 | +66 | + 39 | +449 |
| 18 | 44 | 171 | 106 | 1,484 |
| 23 | 60 | 97 | 868 | 599 |
| + 8 | +39 | +219 | +210 | +4,320 |

2 + 16 + 81 = ____ 19 + 36 + 102 = ____ 65 + 13 + 92 + 14 = ____

4 + 83 + 100 + 56 = ____ 57 + 1,010 + 416 + 12 + 19 = _____

| | | | | |
|---|---|---|---|---|
| 8 | 11 | 5 | 7 | 13 |
| -5 | -6 | -5 | -2 | -8 |

| | | | | |
|---|---|---|---|---|
| 23 | 36 | 27 | 86 | 101 |
| -12 | -24 | -13 | -44 | -91 |

| | | | | |
|---|---|---|---|---|
| 26 | 34 | 41 | 92 | 113 |
| -18 | -27 | -38 | -67 | -77 |

| | | | | |
|---|---|---|---|---|
| 166 | 274 | 617 | 1,807 | 42,631 |
| -159 | -189 | -493 | -928 | -15,874 |

| | | |
|---|---|---|
| 12 - 5 = ___ | 33 - 16 = ___ | 94 - 27 = ___ |
| 6 + 7 - 5 = ___ | 8 - 6 + 13 = ___ | 4 + 7 - 10 = ___ |
| 18 + 20 - 12 = ___ | 41 - 16 + 28 - 4 = ___ | 76 + 11 - 54 - 2 = ___ |

| | | | | |
|---|---|---|---|---|
| 3 | 7 | 9 | 6 | 10 |
| X5 | X3 | X4 | X8 | X 7 |
| 12 | 15 | 11 | 17 | 21 |
| X 7 | X 6 | X 8 | X 5 | X 4 |
| 31 | 48 | 102 | 157 | 256 |
| X12 | X16 | X 21 | X 88 | X 106 |

| | | | | |
|---|---|---|---|---|
| 519 | 1,860 | 7,018 | 5,620 | 8,681 |
| X117 | X 205 | X 416 | X 562 | X1,024 |

5 X 12 = ___ 16 X 8 = ___ 22 X 11 = ___ 101 X 30 = ___

8 X 6 + 4 = ___ 3 X 8 - 6 = ___ 6 X 11 + 5 - 30 = ___

10 + 4 X 12 = ___ 8 - 2 X 4 = ___ 14 + 8 X 1 X 4 - 3 = ___

5(6 - 3 + 17) = ___ 42 - 8(12 - 7) + 13 = ___ (3 + 4)(7 - 7) = ___

$12 \div 3 =$ ___ $16 \div 4 =$ ___ $24 \div 3 =$ ___ $42 \div 7 =$ ___ $81 \div 3 =$ ___

$3\overline{)27}$ $7\overline{)56}$ $11\overline{)121}$ $5\overline{)150}$ $2\overline{)286}$

$23\overline{)1{,}012}$ $72\overline{)864}$ $87\overline{)8{,}874}$ $63\overline{)44{,}919}$

$16\overline{)36}$ $22\overline{)123}$ $19\overline{)3{,}101}$ $40\overline{)20{,}166}$

$68/34 =$ ___ $120/15 =$ ___ $0/312 =$ ___

$18 - 2 + 7 - 10 =$ ___ $20 \times 5 - 4 - 2 =$ ___ $\frac{12 + 3}{11 - 6} =$ ___

# LEVEL ONE

# WHOLE NUMBERS

# LEVEL ONE--WHOLE NUMBERS

## LESSON Counting, numbering, ordering

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Using numbers to give order, meaning; show relationship; understand money, measurement, time

- Review (of past topics, how they pertain to current topic)
  NA

- Vocabulary (any new signs/words/concepts associated with current topic)
  Count, number, digit, order, whole numbers, integers, even, odd, first, etc., place values

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Counting--by 1's, 2's, 5's, 10's, etc.
  Ordering--1st, 2nd, 3rd, etc.
  Place value--one's, ten's, hundred's, etc.
  Digits--like ABC's for words
- Examples (using board, objects, pictures, etc.)
  See Problem Sheet

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  NA

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
See Problem Sheet

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Read/write checks, bills, etc. correctly
Familiarity with basic math vocabulary
Simplify/streamline counting

# Problem Sheet

## Counting

Demo Problems

Count from 5 to 12 by ones. 5, 6, 7, 8, 9, 10, 11, 12
Count from 3 to 24 by threes. 3, 6, 9, 12, 15, 18, 21, 24
Count from 5 to 45 by fives. 5, 10, 15, 20, 25, 30, 35, 40, 45
Count from 1 to 17 by twos. 1, 3, 5, 7, 9, 11, 13, 15, 17
Count backward from 11 to 3 by ones. 11, 10, 9, 8, 7, 6, 5, 4, 3
Count backward from 27 to 9 by threes. 27, 24, 21, 18, 15, 12, 9

Which is first? ◆
Which is fourth? ▼
Which is seventh? ✻
Which is third? ✓
❑ is _____. Second
▲ is _____. Ninth

87,013,205,469

Which number is in the tens place? 6
Which number is in the ten thousands place? 0
Which number is in the millions place? 3
9 is in the _____ place. Ones
7 is in the _____ place. Billions
4 is in the _____ place. Hundreds

13 in words is _____. Thirteen
86 in words is _____. Eighty-six
502 in words is _____. Five hundred two
Ten thousand, four hundred forty-eight in numbers is _____. 10,448
Eight thousand six in numbers is _____. 8006
Nine hundred seventeen thousand in numbers is _____. 917,000
17 thousands, 8 hundreds, 0 tens, 7 ones = 17,807
6 millions, 48 thousands, 5 hundreds, 2 tens, 8 ones = 6,048,528
3 ones, 42 thousands, 6 hundreds, 8 tens = 42,683
4 tens, 4 thousands, 0 hundreds, 1 one = 4,041
0 ten thousands, 6 ones, 5 thousands, 8 hundreds, 0 tens = 5,806

Execution problems

Count from 7 to 16 by ones.
Count from 10 to 50 by fives.
Count from 6 to 27 by threes.
Count from 3 to 13 by twos.
Count from 8 to 48 by fours.
Count backward from 21 to 0 by threes.
Count backward from 11 to 1 by ones.
Count backward from 100 to 0 by tens.

Which is fifth?
Which is second?
Which is ninth?
★ is _____.
■ is _____.
✔ is _____.

1,836,520,749

What number is in the hundreds place?
What number is in the millions place?
What number is in the tens place?
1 is in the _____ place.
2 is in the _____ place.
3 is in the _____ place.

17 in words is _____.
63 in words is _____.
1,040 in words is _____.
Thirty-eight in numbers is _____.
Three hundred nine in numbers is _____.
Ten thousand five hundred thirteen in numbers is _____.
4 thousands, 6 hundreds, 2 tens, 8 ones = ?
5 millions, 86 thousands, 2 hundreds, 0 tens, 5 ones = ?
6 tens, 5 thousands, 3 ones, 8 hundreds = ?

# LEVEL ONE--WHOLE NUMBERS

## LESSON Number Lines

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Mental image of where numbers are, how they relate to each other

- Review (of past topics, how they pertain to current topic)
  Number line is a picture of counting

- Vocabulary (any new signs/words/concepts associated with current topic)
  Number line, positive, negative, greater than, less than, greatest, least, equal, +, -, >, <, =

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Number lines are visual representations of numbers in sequence, show relationship, movement

- Examples (using board, objects, pictures, etc.)
  See Problem Sheet
  Analog clock, ruler, measuring cup, football field, thermometer

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Left = negative, less than
  Right = positive, more than

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
See Problem Sheet

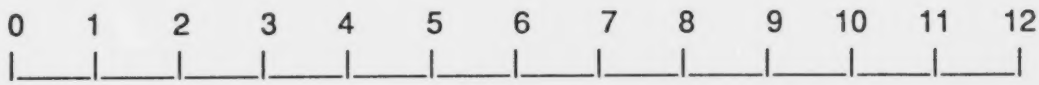
V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Logical thinking, sequences, relationships, measuring, reading charts, maps

# Problem Sheet

## Number Lines

Demo problems




4 is right of 1. 4>1
1 is left of 6. 1<6

8 is right of 5. 8>5
4 is left of 9. 4<9

9 is right of 2. 9>2
7 is left of 12. 7<12

Order least to greatest:

4, 10, 3, 7, 12, 1

6, 3, 2, 11, 0, 9

5, 8, 1, 10, 7, 4

Order greatest to least:

5, 2, 10, 6, 0, 8

1, 4, 11, 9, 5, 2

3, 8, 5, 0, 12, 7

Start at 2. Move +6. Where are you?

Start at 7. Move -3. Where are you?

Start at 0. Move +11. Where are you?

Start at 6. Move -6. Where are you?

Start at 2. Move +5. Move +4. Where are you?

Start at 10. Move -3. Move +5. Move -1. Where are you?

Execution problems

8 is right of 3. 8___3 | 11 is right of 4. 11___4 | 1 is left of 7. 1___7

4 is left of 9. 4___9 | 5 is _____ of 3. 5>3 | 6 is _____ of 11. 6<11

0 is _____ of 8. 0__8 | 10 is _____ of 5. 10__5 | 3 is _____ of 7. 3__7

Order least to greatest:

3, 8, 6, 11, 2, 5 | 10, 4, 0, 7, 1, 9 | 6, 1, 12, 9, 5, 3

Order greatest to least:

1, 4 ,7, 2, 9, 3 | 0, 8, 12, 4, 5, 10 | 3, 8, 11, 2, 5, 9

Start at 3. Move +7. Where are you?

Start at 7. Move +2. Where are you?

Start at 11. Move -5. Where are you?

Start at 5. Move -5. Where are you?

Start at 3. Move +4. Move +2. Where are you?

Start at 9. Move -3. Move +6. Where are you?

# LEVEL ONE--WHOLE NUMBERS

## LESSON Estimating and Rounding

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Estimating is getting a good idea of the answer without figuring
  Rounding is finding the closest easily-manipulated number

- Review (of past topics, how they pertain to current topic)
  Place values

- Vocabulary (any new signs/words/concepts associated with current topic)
  Estimate, round, approximately,

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Estimating can give you an idea of what the answer should be so you can check to see if your calculated answer is probably right or very wrong
  Rounding gives you numbers to use for estimates

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  NA

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: rounding to nearest 10, 100, 1000, etc.; deciding to round up or leave

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Making sure there's enough money, food, fence, rope, etc.
Understanding statistics (10,000 people at the game--exactly?)

# LEVEL ONE--WHOLE NUMBERS

## LESSON Addition

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Combining 2 or more numbers to get a larger number

- Review (of past topics, how they pertain to current topic)
  Moving right on the number line; place values; shortcut counting

- Vocabulary (any new signs/words/concepts associated with current topic)
  Add, sum, carry, +

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Addition involves combining numbers to get a larger number (sum)
  If basic facts are memorized, it is a shortcut to counting
  Addition is commutative

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Answer must be larger than numbers added; think about place value; casting out 9's

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated, including flash cards, manipulable objects--target skills: memorizing basic facts, carrying

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Adding money, legs of a trip, scores, yards in football game, hours worked, pages read

# LEVEL ONE--WHOLE NUMBERS

## LESSON Subtraction

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Take a smaller number away from a larger number; find out how much/many are left

- Review (of past topics, how they pertain to current topic)
  Moving left on the number line; place values; shortcut counting

- Vocabulary (any new signs/words/concepts associated with current topic)
  Subtract, difference, borrow, -

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Subtraction is taking some away, the opposite of addition
  Subtraction is <u>not</u> commutative

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Answer must be smaller than largest number; place value; add up to check answer

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: borrowing, problems involving zero

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Determining money, time, distance, etc. left
Difference between scores, costs, distances, etc.

# LEVEL ONE--WHOLE NUMBERS

## LESSON Multiplication

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Combining same-size groups of numbers to get a larger number; faster than adding

- Review (of past topics, how they pertain to current topic)
  Moving right on number line; shortcut addition; carrying; place values

- Vocabulary (any new signs/words/concepts associated with current topic)
  Multiply, times, of, product, x, •, ( )

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Multiplication is repeated addition
  Basic facts should be memorized
  Multiplication is commutative

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Answer must be larger than numbers multiplied
  Use rounding

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated, including flash cards, manipulable objects--target skills: basic facts memorized, carrying, problems with zero, multiplying by 2, 3, 4,...-digit numbers, keeping proper alignment

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Cooking, figuring cost of multiple items, total distance of a regular commute, total hours in a regular schedule

# LEVEL ONE--WHOLE NUMBERS

## LESSON Division

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Separating larger number into smaller same-size groups; faster than subtraction

- Review (of past topics, how they pertain to current topic)
  Moving left on number line; shortcut subtraction; place values

- Vocabulary (any new signs/words/concepts associated with current topic)
  Divide (by), into, divisor, quotient, ÷, )‾‾, / (fraction bar), remainder

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Division is repeated subtraction, the opposite of multiplication
  It is <u>not</u> commutative
  The answer may not come out even (remainder)
  Answers may be checked by multiplication

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Answer must be smaller than original number, remainder smaller than divisor

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: basic facts, correct procedure, division involving zero, keeping proper alignment

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Cooking, splitting the cost of something, calculating averages

# LEVEL ONE--WHOLE NUMBERS

## LESSON Order of Operations

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Math requires work to be done in the correct order

- Review (of past topics, how they pertain to current topic)
  Basic operations, symbols

- Vocabulary (any new signs/words/concepts associated with current topic)
  Please Excuse My Dear Aunt Sally, parentheses, exponents/roots (as vocabulary items for now--more explanation in a later lesson), order, operation

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Math has a very specific pattern to be followed to get a correct answer
  Please Excuse... helps in remembering the pattern
  Multiplication and division are interchangeable, left to right
  Addition and subtraction are interchangeable, left to right

- Examples (using board, objects, pictures, etc.)
  Instructor generated--how to get the wrong answer, then the right one
  Make one change per line

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  NA

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: following the correct pattern, showing all steps, basic operations

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Following directions, adding ingredients in the right order in a recipe, changing a tire, applying for a job, generally accepting imposed patterns

# LEVEL ONE--WHOLE NUMBERS

## LESSON Time

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Doing math with time is sometimes the same, sometimes different

- Review (of past topics, how they pertain to current topic)
  Basic operations; place values (somewhat different in time), counting by 5's

- Vocabulary (any new signs/words/concepts associated with current topic)
  Second, minute, hour, day, week, month, year, decade, century, millenium, quarter to/after, half past

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Doing math operations with time are different because of different units; conversion occurs between units (over 60 minutes converts to hours and minutes, etc.); basic units should be memorized

- Examples (using board, objects, pictures, etc.)
  Instructor generated; analog/digital, converting seconds to minutes, minutes to hours, etc.

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round to nearest minute, hour, etc.

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: basic operations with time, conversions, how many seconds in a minute, in six minutes, etc.

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
How long activities take; figuring work hours, overtime, exact ages

# LEVEL ONE--WHOLE NUMBERS

## LESSON Temperature

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Temperature in Fahrenheit and Celsius

- Review (of past topics, how they pertain to current topic)
  Number line; basic operations

- Vocabulary (any new signs/words/concepts associated with current topic)
  Thermometer, temperature, Fahrenheit, Celsius, centigrade, degree, formula

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  How formulas work; converting from F to C using the formula (F=9/5 C+32)
  Basic operations with temperature

- Examples (using board, objects, pictures, etc.)
  Instructor generated; averaging temperatures, thermometer as a number line, graphing

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Same as regular numbers, use averages

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: converting from F to C, basic operations with temperature, graphing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Checking for fever, understanding those bank thermometers!, more understanding for word problems, creating/reading graphs

# LEVEL ONE--WHOLE NUMBERS

## LESSON Word Problems

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)

  Everybody hates them--get over it!; looking for key words; reading for understanding

- Review (of past topics, how they pertain to current topic)

  Basic operations

- Vocabulary (any new signs/words/concepts associated with current topic)

  Words that can give hints to which operation to use (more than, less than, of, all together, left, how many, how many more, etc.)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)

  Word problems are real-world math; they can be deciphered; pictures can help; answer will probably include units (tons, days, dollars, shirts, etc.); they may involve more than one operation

- Examples (using board, objects, pictures, etc.)

  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

  Does the answer make sense (not too large, not too small, right units, etc.)? Check with methods used for number problems.

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: reading with understanding, creating problems, basic operations, English/ASL translated to math language, answers with correct units

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Word problems are math we use everyday: gas mileage, bank balance, cost of food, size of rug, etc.

# LEVEL TWO

# FRACTIONS

# LEVEL TWO--FRACTIONS

## LESSON Prime and Composite Numbers

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  A different way of looking at numbers--are they prime (divisible only by themselves and 1) or composite?

- Review (of past topics, how they pertain to current topic)
  Multiplication; division

- Vocabulary (any new signs/words/concepts associated with current topic)
  Prime, composite, factor, divisor, multiple, GCF, LCM, factor tree

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Prime number has exactly two different divisors, 1 and itself
  Composite number is product of two numbers *other than* 1 and itself
  "Multiples of" = "Counting by" starting with that number

- Examples (using board, objects, pictures, etc.)
  Divisibility tests for 2, 3, 5, 10; factor trees, repeated division for composite examples

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: factor trees, repeated division, divisibility tests, GCF, LCM, multiples

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Knowing about primes and composites will make working with fractions easier; students will have another way of defining numbers, making them more usable

# LEVEL TWO--FRACTIONS

## LESSON Exponents and Roots

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Another way to look at/define numbers, shorthand way to show factors

- Review (of past topics, how they pertain to current topic)
  Prime factors, multiplication, division, order of operations

- Vocabulary (any new signs/words/concepts associated with current topic)
  Exponent, power, base, root, square, cube, area, volume, radical, $\sqrt{\ }$

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Exponent shows how many times base is multiplied by itself; root is opposite of exponent; exponent is short way to write identical factors; 10 has some special and useful properties

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: figuring various powers, identifying frequently used roots, using vocabulary correctly, order of operations

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Use of different names to describe the same thing, depending on needs
Somewhat like synonyms in English
Use academically sophisticated terminology

# LEVEL TWO--FRACTIONS

## LESSON Parts of a whole

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Fractions show equal parts of a whole; they have a specialized vocabulary

- Review (of past topics, how they pertain to current topic)
  Division, prime factors, less than/greater than

- Vocabulary (any new signs/words/concepts associated with current topic)
  Fraction, part, whole, numerator, denominator, proper, improper, unit fraction, mixed number, equivalent fractions, reduce, cancel

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Denominator shows how many total parts, numerator shows how many parts are being considered, unit fractions help to reduce or to create equivalent fractions

- Examples (using board, objects, pictures, etc.)
  Instructor generated--measuring implements, counting, comparing

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  NA

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Student-generated fraction kits, Instructor-generated tasks--target skills: numerical representations of manipulable objects, equivalents, reducing, ranking in size

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Cooking, measuring, using fractions to describe (1/5 of my life, 2/3 of your paycheck

# LEVEL TWO--FRACTIONS

## LESSON Multiplication

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Multiplication is the simplest operation with fractions

- Review (of past topics, how they pertain to current topic)
  Whole number multiplication, reducing, fraction vocabulary

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Multiply numerators, multiply denominators, reduce
  Cancel any common factors, then multiply numerators, denominators (may be easier if numbers are large)

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Answer will be a smaller fraction

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: computation, reducing, use of the word "of", changing mixed numbers to improper fractions

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Changing recipes, measurements; changing the scale of a map

# LEVEL TWO--FRACTIONS

## LESSON Division

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Division of fractions is much the same as multiplying fractions--to solve a division problem, it must first be changed to a multiplication problem

- Review (of past topics, how they pertain to current topic)
  Multiplying fractions

- Vocabulary (any new signs/words/concepts associated with current topic)
  Reciprocal, invert

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  To divide fractions, replace the divisor with its reciprocal, change the sign to multiplication, and proceed

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: finding a reciprocal, multiplication, reducing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Figuring fractional divisions of a whole/whole divisions of a fraction

# LEVEL TWO--FRACTIONS

## LESSON Addition

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Only fractions with common denominators may be added

- Review (of past topics, how they pertain to current topic)
  Prime factors, multiples, equivalents, reducing

- Vocabulary (any new signs/words/concepts associated with current topic)
  Common denominator, LCD

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Adding fractions requires a common denominator; multiply fractions to be added by unit fractions that will make all denominators equal; use that denominator for the answer; add the numerators; reduce if necessary

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round fractions to get a number near where the answer should be--i.e., 2/7 is less than 1/2, 7/8 is almost 1, so the answer should be between 1 and 1 1/2

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: finding LCD, using that LCD in the answer, addition, reducing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Totalling fractional distances travelled, fractional hours worked

# LEVEL TWO--FRACTIONS

## LESSON Subtraction

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Subtraction of fractions also requires a common denominator

- Review (of past topics, how they pertain to current topic)
  Prime factors, multiples, equivalents, reducing

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Find the LCD for the fractions, use that denominator for the answer, subtract the numerators, reduce the answer if necessary

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round as for addition

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: finding LCD, subtraction, reducing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Comparing distances, amounts; after part is used, how much is left

# LEVEL TWO--FRACTIONS

## LESSON Mixed numbers

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Addition, subtraction, multiplication, division with mixed numbers

- Review (of past topics, how they pertain to current topic)
  Changing mixed numbers to improper fractions and vice versa; reducing; basic operations

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Multiplication and division--change mixed numbers to improper fractions
  Addition--leave as mixed numbers; add whole numbers, then fractions; reduce as necessary
  Subtraction--may need to borrow 1 (unit fraction) from the whole number

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round mixed numbers to the nearest whole number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: basic operations, changing mixed numbers/improper fractions, borrowing, reducing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Comparing heights, weights; totalling legs of a trip; figuring gas mileage

# LEVEL TWO--FRACTIONS

## LESSON Measurement

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)

  Measuring often involves fractions, mixed numbers

- Review (of past topics, how they pertain to current topic)

  Fractions commonly used in measurements, basic operations with fractions and mixed numbers, unit fractions

- Vocabulary (any new signs/words/concepts associated with current topic)

  English system, inch, foot, yard, mile, cup, pint, quart, gallon, ounce, pound, ton

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)

  Measurements use fractions and mixed numbers; the ability to read measuring instruments is important; some measurements are very small and require accuracy; unit fractions (12 in./1 ft., 1 gal./4 qt., etc.) are sometimes used in calculations

- Examples (using board, objects, pictures, etc.)

  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

  Round to the nearest easily manipulable number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: reading measuring instruments, basic operations, using appropriate units

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Cooking; measuring size of room, cloth, yard, etc.; understanding measurement references, comparison shopping

# LEVEL THREE

# DECIMALS

# LEVEL THREE--DECIMALS

## LESSON Decimal Notation

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Decimals are a special kind of fraction

- Review (of past topics, how they pertain to current topic)
  Place values, multiples of ten

- Vocabulary (any new signs/words/concepts associated with current topic)
  Decimal, decimal point, --th

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Decimals are fractions whose denominators are multiples of ten; they are to the right of the decimal point; each step to the right is dividing by ten

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  NA

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: using accurate nomenclature, identifying place values

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Using correct ASL/English terms for numbers and vice versa

# LEVEL THREE--DECIMALS

## LESSON Addition

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Addition of decimals is identical to addition of whole numbers; decimal points must line up

- Review (of past topics, how they pertain to current topic)
  Whole number addition

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Line up decimal points in numbers to be added and sum; zeros may be added on the right of the decimal point to help do this; add from right to left

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round to nearest whole number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: Lining up decimal points, addition, correct nomenclature for numbers

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Odometer reading; adding hours worked, distances, etc.

# LEVEL THREE--DECIMALS

## LESSON Subtraction

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Subtraction of decimals is identical to subtraction of whole numbers; decimal points must line up

- Review (of past topics, how they pertain to current topic)
  Whole number subtraction

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Line up decimal points in numbers to be subtracted and difference; zeros may be add on the right of the decimal point; subtract from right to left

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round to nearest whole number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: Lining up decimal points, subtraction, correct nomenclature for numbers

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Figuring differences in decimal numbers (heights, populations, statistics, etc.)

# LEVEL THREE--DECIMALS

## LESSON Multiplication

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Multiplication of decimals is almost like multiplying whole numbers

- Review (of past topics, how they pertain to current topic)
  Whole number multiplication, powers of ten

- Vocabulary (any new signs/words/concepts associated with current topic)

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Ignore the decimal points and multiply; count how many decimal places in the factors; place the decimal point in the product so it has that many places; sometimes zeros must be added to have the correct number of places; if multiplying by a power of ten, just move the decimal point to the right the same number of places as the number of zeros in the power of ten

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round the factors and use the estimated product for correct placement of the decimal point

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: multiplication, correct placement of the decimal point, multiplying by powers of ten

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Finding the area of a room; weight, height of several things; mileage

# LEVEL THREE--DECIMALS

## LESSON Division

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Division with decimals requires careful attention to make sure the decimal point is in the right place

- Review (of past topics, how they pertain to current topic)
  Whole number division, multiplication of decimals by 10

- Vocabulary (any new signs/words/concepts associated with current topic)
  Dividend

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Dividing decimals by whole numbers requires only that the decimal point in the quotient be placed directly above the decimal point in the dividend; dividing by decimals requires that the divisor be changed to a whole number by moving the decimal point to the right and that the decimal point in the dividend be moved the same number of places; zeros may need to be added to the dividend or the quotient to line up correctly; dividing by multiples of ten requires moving the decimal point to the left

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Round to the nearest whole number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: division, moving the decimal points the correct number of places, dividing by powers of ten

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Splitting decimal amounts, finding averages, figuring GPA

# LEVEL THREE--DECIMALS

## LESSON Fractions to Decimals

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Converting fractions to decimals (or vice versa) involves division

- Review (of past topics, how they pertain to current topic)
  Division, decimal notation, reducing

- Vocabulary (any new signs/words/concepts associated with current topic)
  Terminating decimal, repeating decimal

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Divide numerator by denominator; if not terminating, use a bar over the repeating number(s), write the remainder as a fraction, or round off
  Write decimal number over its place value, reduce as necessary
  Common equivalents should be memorized

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: division, handling repeating or non terminating answers, common equivalents memorized, reducing

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
More facility with fractions and decimal numbers

# LEVEL THREE--DECIMALS

## LESSON Money

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  Problems involving money are just decimal problems

- Review (of past topics, how they pertain to current topic)
  Basic operations with decimals

- Vocabulary (any new signs/words/concepts associated with current topic)
  Dollars, cents

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  Math money problems are decimal problems with only two decimal places and a dollar sign; rounding may be required to obtain the two places

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)
  Rounding to the nearest appropriate number

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: basic operations with decimals, rounding, using correct units

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Figuring wages, costs, payments, etc.; comparison shopping

# LEVEL THREE--DECIMALS

## LESSON Percent

I. INTRODUCTION

- Topic (a brief explanation of the topic of the day, why you will be discussing it)
  To perform calculations with percents, we must first change them to decimals or fractions

- Review (of past topics, how they pertain to current topic)
  Decimals, place values, fractions

- Vocabulary (any new signs/words/concepts associated with current topic)
  Percent, %

II. INSTRUCTION

- Explanation (in-depth explanation of current topic)
  To change a decimal to a percent, move the decimal point two places to the right. adding a zero if necessary, and add the percent sign
  To change a percent to a decimal, move the decimal point two places to the left, adding a zero if necessary, and remove the percent sign
  To change a fraction to a percent, multiply the fraction by 100%
  To change a percent to a fraction, place the percent over 100 and reduce

- Examples (using board, objects, pictures, etc.)
  Instructor generated

- Estimating (discussion of ways to approximate answers as a means of checking accuracy)

III. DISCUSSION

- Observations (what have students noticed about the topic?)

- Q & A (what questions do students have about the topic?)

- Examples (elicited from students)

- Estimating (students create ways to estimate answers)

IV. EXECUTION/MANIPULATION (number/word problems involving current topic; in-class and homework)
Instructor generated--target skills: changing percents to decimals, fractions and vice versa, basic operations, figuring percent of ...

V. MASTERY (summary evaluation of current topic--students must demonstrate 90% accuracy before proceeding)
Instructor generated

VI. BRIDGE (how does current topic apply to other classes/to out world--how will students use skills learned?)
Figuring percent off, sales tax, tips, deductions, grades